REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow.

I. Status of Claims

Claims 1-16 are pending, with claims 11-16 withdrawn

Claim 17 is added presently, with ample support in the specification, for example, at page 6, second paragraph. Thus, no new matter is added and entry of claim 17 is respectfully requested. Upon such entry, claims 1-10 and 17 will be presented for examination on the merits.

II. Claims 1-10 and 17 Are Not Obvious

Claims 1-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US 2003/0044669 ("Hidaka") in view of US 2002/0182478 ("Uchida"). Claim 10 is rejected under § 103(a) as unpatentable over Hidaka in view of Uchida, and further in view of US 2003/0104284 ("Inagaki"). Applicant respectfully traverses the rejections, because the cited references, either alone or in combination, do not teach or suggest each and every element of the claimed invention.

a. Current Obviousness Standard

The U.S. Supreme Court reaffirmed the Graham factors for determining obviousness in *KSR Int'l Co. v. Teleflex Inc.* (No. 04-1350) (U.S., April 30, 2007). The Graham factors, as outlined by the Supreme Court in *Graham et al. v. John Deere Co. of Kansas City et al.*, 383 U.S. 1 (1966), are: 1) determining the scope and contents of the prior art; 2) ascertaining the differences between the claimed invention and the prior art; 3) resolving the level of ordinary skill in the pertinent art; and 4) evaluating evidence of secondary consideration. The Supreme Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the

claimed subject matter is obvious under 35 U.S.C. § 103(a) and held that the proper inquiry for determining obviousness is whether the improvement is more than the predictable use of prior art elements according to their established functions. The Court noted that it is "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed and specifically stated:

> Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was ***an apparent reason to combine the known elements in the fashion claimed*** by the patent at issue. To facilitate review, this analysis should be made explicit.

KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1741 (2007) (emphasis added). As discussed below, the cited art cannot render the claimed invention obvious.

b. Claims 1-9 Are Not Obvious Over Hidaka and Uchida

Present claims 1-9 are non-obvious over Hidaka and Uchida, because neither reference teaches or suggests the claimed relationship of "$a \pm b \leq d$." As reflected in claim 1, the present invention is a polymer electrolyte composite membrane comprising a porous base material having fine pores which are filled with a polymer electrolyte comprising a hydrophobic moiety and a hydrophilic moiety, wherein each phase of the hydrophobic and hydrophilic moieties of the polymer electrolyte satisfy the following formula (1)

$$a \pm b \leq d \qquad (1)$$

wherein a represents the size (nm) of a hydrophobic domain, b represents the size (nm) of a hydrophilic domain, and d represents the average pore diameter (nm) of fine pores of the porous base material. For the reasons below, Hidaka and Uchida do not describe the relationship set forth in formula (1).

In the Office Action, the Examiner posits that (i) Hidaka teaches a composite polymer electrolyte membrane comprising a porous membrane and that the pores are filled with polymer electrolyte; (ii) Hidaka teaches that the polymer electrolyte is a block polymer comprising one or more blocks in which sulfonic acid groups (hydrophilic) are introduced and one or more blocks in which polyether sulfones (hydrophobic) are introduced; (iii) Hidaka teaches that the membrane has a pore size of 0.01 μm (10 nm) to 10 μm (10000 nm); and (iv) Hidaka fails to teach hydrophilic/hydrophobic domain sizes.

As the Office Action acknowledges, Hidaka is silent on the claimed relationship of "$a \pm b \leq d$," noting at page 3 that "Hidaka does not teach hydrophilic/hydrophobic domain sizes." Attempting to remedy Hidaka's deficiency, the Action cites Uchida.

In particular, the Office Action alleges that (i) Uchida discloses a fuel cell comprising a polymer electrolyte membrane and a pair of electrodes having a catalyst layer on a surface which is in contact with the polymer electrolyte membrane and sandwiching the polymer electrolyte membrane therebetween; (ii) the catalyst layer of at least one of the electrodes comprises carbon particles supporting a noble metal catalyst, and the carbon particles include at least two kinds of carbon particles adsorbing a polymer electrolyte; (iii) Uchida teaches that the polymer electrolyte comprises a hydrophilic group and a hydrophobic group; (iv) Uchida teaches that the combined size of the hydrophilic and hydrophobic domains ranges from 10 nm to 200 nm; (v) Uchida teaches that pores formed on the composite membrane ranges from 10 to 200 nm; (vi) Uchida teaches that due to the size of the hydrophilic and hydrophobic domains and the pore diameter, it is possible to bring the catalyst particles and the polymer electrolyte into contact with each other satisfactorily and increase the reaction area of the catalyst. Notably, the Office Action cites paragraphs [0075]-[0079] as the basis for the above assertions (iii) through (vi).

Uchida, however, does not remedy Hidaka's deficiency. Although the Action cites paragraph [0079] of Uchida for teaching a "combined size of the hydrophilic and hydrophobic domains ranges from 10 nanometer and 200 nanometer," Uchida, in fact, describes an entirely different matter. Indeed, Uchida merely teaches a preferred size of electrolyte particles dispersed

in a dispersion, which are to be adsorbed by carbon particles. Thus, Uchida is silent on a combined size of hydrophilic and hydrophobic domains and therefore fails to teach such a combination. Moreover, Uchida's description of a preferred size for dispersed polymer electrolyte particles and carbon particle pores is immaterial to the porous membrane pore size and hydrophilic/hydrophobic domain size taught by Hidaka. Thus, one of ordinary skill in the art would have no reason to combine Uchida with Hidaka's composite polymer electrolyte membrane to arrive at the presently claimed invention, in direct contravention of *KSR*. The combination of Hidaka and Uchida, therefore, fails to teach or suggest the claimed "$a \pm b \leq d$" relationship. Accordingly, present claims 1-9 are non-obvious over the Hidaka and Uchida.

Applicant, therefore, respectfully requests that the obviousness rejection be withdrawn.

c. Claim 10 Is Non-Obvious Over Hidaka, Uchida and Inagaki

In relation to claim 10, Inagaki does not remedy the deficiencies of Hidaka and Uchida, noted above. Accordingly, the combination of Hidaka, Uchida and Inagaki fail to teach or suggest the claimed "$a \pm b \leq d$" relationship. Thus, claim 10 is non-obvious over the cited references.

Applicant, therefore, respectfully requests that the obviousness rejection be withdrawn.

d. Claim 17 is Non-Obvious Over Hidaka, Uchida and Inagaki

In relation to newly added claim 17, Hidaka, Uchida and Inagaki do not render the claim obvious for the same reasons presented above.

CONCLUSION

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date MAY 20 2011

By /Michael D. Kaminski, Reg. No. 32,904/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5490
Facsimile: (202) 672-5399

Michael D. Kaminski
Attorney for Applicant
Registration No. 32,904